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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,657	01/20/2004	Chin-Kun Fang	67,200-1176	3412

7590 11/03/2005  
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EXAMINER

NOVACEK, CHRISTY L

ART UNIT PAPER NUMBER

2822

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/761,657

Applicant(s)

FANG ET AL.

Examiner

Christy L. Novacek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 21-31 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-20 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This office action is in response to the Election filed August 9, 2005.

#### ***Election/Restrictions***

Applicant's election of Group I, claims 1-20 in the reply filed on August 9, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 21-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on August 9, 2005.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamatsu (US 6,215,197) in view of Applicant's admitted prior art.

Regarding claim 1, Iwamatsu discloses providing a process wafer having active area trenches (10B, 10C) and at least one inactive area trench (10A1, 10A2), forming a filling layer (2) over the active area trenches and the inactive area trenches to substantially fill the trenches, forming a resist layer having patterned portions (52) disposed between the active area trenches

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and the inactive area trenches, removing the filling layer not covered by the resist layer, removing the resist layer, and planarizing the wafer process surface such that the active area trenches and the inactive area trenches are substantially coplanar (Fig. 12-15; col. 13, ln. 61 – col. 14, ln. 40). Iwamatsu does not disclose that the inactive area trench overlies a laser-marked portion. Applicant's admitted prior art discloses that it is conventional in the art to form a laser-marked identification mark on the periphery of a wafer so as to be able to track the wafer throughout the various processing steps that it will undergo (paragraph 002). At the time of the invention, it would have been obvious to one of ordinary skill in the art to provide a laser-marked identification mark at the inactive peripheral area of the wafer of Iwamatsu in order to be able to track each particular wafer through its processing steps.

Regarding claim 2, Iwamatsu discloses that the planarization process is a CMP process (col. 14, ln. 35-40).

Regarding claim 3, Iwamatsu discloses that the step of removing the filling layer portion is conducted by a dry etching process (col. 14, ln. 20-30).

Regarding claim 4, the admitted prior art discloses that the laser-marked identification mark is conventionally forming in an exclusion area at the process wafer periphery adjacent the process wafer peripheral edge (paragraph 002).

Regarding claim 5, Iwamatsu discloses that the active area trenches are shallow trench isolation trenches (claim 1).

Regarding claim 6, Iwamatsu discloses that the process wafer is a silicon substrate (1) and has an overlying nitride layer (4) (col. 14, ln. 1-5).

Regarding claim 7, Iwamatsu discloses that the filling layer is silicon dioxide (col. 14, ln. 15-19).

Regarding claims 8-10, Iwamatsu does not disclose the shapes and sizes of the patterned portions. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use routine experimentation to determine optimal shapes and sizes of the patterned portions of Iwamatsu, depending upon the sizes and shapes of the semiconductor devices on the active areas of the wafer and the sizes and shapes of the necessary isolation trenches in the wafer, because such variables of art recognized importance are subject to routine experimentation and discovery of an optimum value for such variables is obvious. See *In re Aller*, 105 USPQ 233 (CCPA 1955).

***Allowable Subject Matter***

Claims 11-20 are allowed.

The following is an examiner's statement of reasons for allowance:

The primary reasons for the allowance of claims 11-20 is the inclusion therein, in combination as currently claimed, of the limitations of forming a resist having first patterned portions over the active area and an unpatterned portion over the inactive area, patterning the resist layer to form second patterned portions between the active and inactive areas, and etching through exposed portions of the filling material using the first and second patterned portions. These limitations were found in claims 11-20 and are neither disclosed nor taught by the prior art of record, alone or in combination.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Fu et al. (US 6,803,291), Yang et al. (US 6,790,742) and Kitazawa et al. (US 6,667,221) disclose forming alignment marks and STI and preetching the filling oxide layer prior to planarization.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN  
October 28, 2005

A handwritten signature in black ink, appearing to be "CLN", is written over a horizontal line.